

TOWARDS BUILDING A MODEL OF EDUCATIONAL SUCCESS:

A SITUATED INQUIRY

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ABSTRACT

In recent years, Singapore has emerged as a major hub of international education in South East Asia. The innovations in Singapore were motivated by a need to prepare the students to meet the challenges of the 21st century. It can be easily seen that globalisation and intensifying economic competition were the driving forces behind most of these innovations. For a number of countries in Asia, Singapore education today stands as a model that they could follow and perhaps emulate. Two questions however need exploration: Is there a singular model of Singapore educational success? If yes, what are the essential elements of such a model?

This review paper tries to address these questions by building a conceptual model of Singapore Education that could be applied to the education of young adults in developing countries. The study focuses on qualitative (Verbal) and Quantitative reasoning processes, since these processes (and their combinations in various patterns) may lie at the foundation of various education programmes.

KEYWORDS: South East Asia, Singapore Education

INTRODUCTION

Background

Singapore education system has undergone a number of changes and innovations. The innovations were motivated by a need to prepare the students to meet the challenges of the 21st century. It can be easily seen that globalisation and intensifying economic competition were the driving forces behind most of these innovations. Today, Singapore stands as a major hub of international education in South East Asia. For a number of countries in Asia, Singapore stands as a model of educational success that they could follow and perhaps emulate. Two questions however need exploration: Is there a singular model of Singapore educational success? If yes, what are the essential elements of such a model?

This review paper tries to build a model that could mainly be applied to the education of young adults in developing countries. It is based on field research conducted in the last 15 years with the students, teachers, and other stakeholders in Singapore. The paper is largely based on studies in which the authors of this paper were personally involved.

METHOD OF STUDY

The major challenge faced in the design of the study was to create a model of educational success that could be applied to most kinds of education. The design of the study took into account studies that focus on processes rather than products. The present study is concentrated on qualitative (Verbal) and Quantitative reasoning processes, since these

processes (and their combinations in various patterns) may lie at the foundation of various education programmes. As has been pointed out by earlier researchers, adding quantitative information to qualitative modeling allows more precise characterization of systems and their behaviors. (Kuipers and Berleant, 1988).

This review paper is based on studies that have the following main features:

- **Diverse Sources of Data:** Data is collected from various institutions in Singapore. Methods such as observation studies, content analysis, student interviews, teacher interviews and focus group discussions are used.
- **Longitudinal Studies:** Most of the studies have been conducted over a longer period of time. Since some research is conducted as follow-up of previous work, there is interconnectivity between the studies. This interconnectivity helped us draw more definitive conclusions.
- **Focus on Young Adult Students:** Most of the studies were conducted either in high school or university context. This selection of the learning context supports our purpose to build a model for the education of young adults in developing countries.

The Emerged Model

An extensive review of longitudinal study was undertaken. The review concentrated on studies done with young adult learners and more attention was given to studies in which the authors of this paper had personal involvement. A content analysis of the results of each study was performed with an intention to find inherent factors that led to educational success in each study. These factors were then clubbed together to form major categories that would create dimensions of the Singapore Model for Education Success. Following are the six dimensions of the emerged model:

- *Student Group Collaboration* forms the basis of most teaching and learning activities in Singapore. Such collaboration may be face-to-face or online.
- Teaching as well as learning activities in Singapore classrooms are generally oriented towards *application of learning*. Repetitive and mindful practice is usually embedded in as many activities as possible.
- Multimedia and other *interactive technologies* are consciously built into teaching and learning. Focus is on integration of these technologies to achieve the instructional objectives.
- *Context of learning* and of the possible applications of learning is considered significant. At times, concepts to be learnt may be situated in context dependent simulations.
- It is evident that most of the Singapore classrooms aim at achieving *conceptual understanding*. Although practice is important for a transfer of learning to real-life situations, it is important that deep-rooted conceptual understanding is achieved in any educational task.
- Considerable value is placed on *learning through mistakes and failures*. In some Singapore classrooms, errors may even be organized and classified so that a pattern of learning can be constructed. Short-term failures may be seen as inevitable; and such 'fruitful mistakes' or productive 'failures' that aid the learning may even be systemically encouraged.



Figure 1: Six Dimensions of the Singapore Model for Educational Success

These six features of the model have been explained in detail in the following sections. We have provided relevant examples from related research works so that emulation of such practices can be facilitated.

Student Group Collaboration Forms the Basis OF Most Teaching and Learning Activities. Such Collaboration May Be Face-to-Face or Online

Collaborative processes involving short-term (e.g. group discussion or brainstorming) and long-term (e.g project work) group work forms the nucleus of a number of educational activities in Singapore classrooms. It has been seen that collaboration processes tend to become increasingly complex in projects aimed at knowledge generation. Since educators' experiences support the idea of widening the palette of types of group work used in education (Holtham, Melville, and Sodhi, 2006), most of the writing curricula use group work and collaboration in one form or the other. Educators' experiences, however, also show that not all of this collaboration is successful. Educators have highlighted problems such as free riding or social loafing (Brooks and Ammons, 2003; Mello, 1993). It has also been found that individual members' satisfaction (or absence thereof) may influence team performance. (Alge et al, 2003; Johnson et al, 1991; Jaques, 2000; Koppenhaver and Shrader, 2003).

In the study that we would like to provide as an example (Pathak and Intratat, 2010), the subjects were university students studying core courses that required included a group writing project in which the students had to work collaboratively and cooperatively. The student groups aimed to produce a longish piece of audience-oriented writing. Although students were free to choose their audience, they were expected to have a clear and specific idea about their audience through within-group deliberations. They were encouraged to formulate a communication strategy that is appropriate to that audience, and subsequently implement that strategy in the production of a discursive piece of writing aimed at knowledge generation. They were restricted in terms of the choice of an academic research topic and were asked to produce an academic report.

The following data sources were used in this study (Pathak and Intratat, 2010):

- Student responses to questionnaires
- Teacher interviews.
- Interactions on a Facebook page created for the course

The first instrument used in the study was a questionnaire for students. The questionnaire used Likert scale and was administered individually. The questions were related the students' styles of working and learning, emotional maturity, participation and involvement in the group, self-discipline, and satisfaction of teamwork. The questionnaire aimed to explore the following issues:

- Method of decision-making
- Voicing out disagreements
- The role of a whistle blower
- Adherence to task deadlines
- Sense of belonging in a group

The study also involved interviews of teachers. The format of the interview was open and teachers were encouraged to explain their views in detail. The following issues were explored.

- Intrinsic value of collaboration
- Student perception of the value of collaboration
- Collaboration as source of noise
- Strategies to encourage collaboration
- Assessment issues
- Challenges in student collaboration

In a follow-up study, Pathak (2012) analysed interactions on a Facebook page created for a set course in the university curriculum. From the analyses presented in the two studies, it can be interpreted that Singaporean students attribute high value to task planning and sharing their work equally. They are usually 'happy' to work collaboratively and emphasized individuality and responsibility rather than reliance on the group members. In general, it seems that Singapore students were also more individually inclined. This study indicates that Singapore students are generally collaborative in their attitude and can learn better with a collaborative instructional environment where necessary guidance and structure is provided.

Collaborative practices in Singapore classrooms are so widespread that their extension can be easily and naturally seen in e-learning situations. A study by Pathak et al (20) shows that asynchronous web-based interactions (and collaboration) can add a special dimension to learning. The study presents an analysis of two projects with Engineering students. In both instances, institutionalized discussion boards were created for online group interaction. Data for both projects were collected from student surveys and postings on the discussion boards. Students in the first project viewed themselves as accountable for their own learning, whereas students in the second project had a negative perception of the online discussion platform. Analysis of student postings from both studies, on the other hand, provided an insight into how individuals identified themselves as an online group and how such groups are maintained.

Analyses of these and similar studies show that collaboration is an important dimension of the success of Singapore classrooms. Studies show that group work, teamwork, and collaboration are deeply rooted in educational

practices and students as well as students see them as essential parts of educational activities.

Teaching as well as Learning Activities are Oriented towards Application of Learning. Repetitive and Mindful Practice is Usually Embedded in as Many Activities as Possible

Although learning of theories and concepts is considered vital in Singapore classrooms, the application of these theories and concepts is considered equally important. Theories and concepts are immediately applied in practical situations. When possible, mindful practice of learnt ideas is immediately implemented. In a number of situations the method of teaching the theory or principles is itself rooted in application. We would like to provide an example of such an approach. In a study conducted in 2008, the use of a method that combines role-play with discourse analysis was analysed to train students for a job interview. The method presented in this study (Pathak, 2008) seems to be a characteristically effective method for three reasons:

- It helps students establish an emotional connection with the topic of training.
- It includes students as actors rather than passive recipients. This is done by providing the students an insider view of the interview process. The role plays followed by transformative critiques challenge the textbook myth of the all-knowing, in-control interview machine. It presents the realities of the interruptions, disruptions, and communication failures for which interviewees and interviewers are responsible.
- It helps students focus on the elements of the self. The activity presented in the paper helps students focus more on their perceptions and on their attribution behaviour. This focus helps them adapt their communication behaviour.

Multimedia and other Interactive Technologies are Consciously Built into Teaching and Learning. Focus is on Integration of these Technologies to Achieve the Instructional Objectives

Singapore classrooms have been integrating multimedia and web-based interactive technologies in their curricula since 1995. Research studies show that schools and educators are more interested in the integration rather than supplementation of technologies. In a study conducted in a Singapore university (Pathak and Cavallaro, 2006), the effectiveness of Role Play was compared against that of an educational computer-based game (ECBG). These two methods were applied in the conflict resolution (CR) part of a business communication course in a Singaporean university. Three groups of computer engineering students studying communication skills participated in the study.

The aim of the CR lessons was to teach the students to deal with a difficult person in the context of asking for a raise. This experiment tries to explore ways how traditional methods such as a face-to-face lecture or a role-play activity can be integrated with interactive technologies such as educational games. All groups were initially given a lecture on CR methods. Then one group was asked to work through a Role Play (RP) activity; another group worked on a computer game (G) and the last group was asked to engage in both activities.

The study was designed to answer the following three questions:

- Which method (Role play or computer game) leads to more effective learning in terms of the achievement of the course objectives and Why?

- Which method is preferred by the students?
- Which particular features of each of the methods seem to work better?

The data seems to support the thesis that the RP method is marginally better than G even though the effect is not statistically significant. The results also show that the Role Play method is generally preferred by the students who wish to transfer their skill to real-life situations. Ratings given by the subjects indicate that out of the given five features of Interactive Game, Animation helped them to learn most, followed closely by the use of Humour. In the case of Role Play method, Tutors' comments helped to learn them the most, while observing other teams playing the roles was the second-most important factor, followed closely by enactment of the situation. This and similar studies show that educators in Singapore tend to focus more on a blend of technologies with the conventional methods of teaching.

In another study (Pathak and Chaudhary, 2005), an experiment was set up to investigate what teachers can do to make web-based electronic lectures (e-lectures) equally (or more) effective compared to face-to-face lectures. The experiment involved five lecturers and about five hundred students in a technological university in Singapore. Teachers recorded their lectures using customized software. Extensive interviews of these teachers and questionnaires administered on the students who viewed these lectures showed that teachers' concerns clashed with the students' concerns in areas related to content and delivery. While teachers seem to be more preoccupied with their body language, facial expressions, and trite organization, students seemed to focus on voice, matter on the slides and did not mind a rather repetitious delivery. The study shows that the effectiveness of e-lectures in Asian education would largely depend on the extent to which the teachers are able to address the students' concerns. To achieve this, the teachers would also need to enhance their awareness of the new medium. This study proposes collaboration between students and teachers to produce more effective e-lectures.

Context of Learning and of Applications of Learning is Considered Significant. At Times, Concepts to be Learnt May be Situated in Context Dependent Simulations

The ultimate goal of any education is successful application of learnt content and skills. Educators however sometimes experience a failure of training transfer for various reasons. One possible reason for such a failure is that the learnt content may not be applicable to newly developed contexts. Such failures can be avoided if the teaching and learning are rooted deep in the contexts. We can envisage two kinds of contexts for learning:

- **Larger Context:** Educators need to take into account the larger context of education. They need to ask and answer questions such as: Where do the learners come from? Why are they studying? What are their short-term and long-term objectives?
- **Immediate Context:** The classroom or the immediate context in which learning takes place is framed by the learners' assessments of their learning environment, as well as the strategies used by them to cope with the educational challenges,

The number of immigrants who come to study in Singapore is substantial and learning English becomes a major issue for these students. Their ESL teachers frequently express concerns about their progress. The issues these students face include comprehending verbal instruction and communication. It has been suggested (Choi, 2005) that there is limited

current literature related to the education of ESL nursing students. This situation encouraged a qualitative study (Pathak and Sng, 2010) that aimed at analyzing nursing students' ESL needs. Such studies clearly demonstrate how curriculum development in Singapore is deeply grounded in current and ground-level educational research.

One such study (Pathak and Sng, 2010) began with the intention of identifying the learning needs of nursing students who have migrated from a non-English speaking to an English-speaking country. Seven students from China studying a nursing course in Singapore narrated their stories in open interviews. These students narrated their learning and communication experiences in their home country, namely, China, and their learning institutions in Singapore. This study shows the need for language teachers and curriculum planners to consider the needs of learners as perceived by the learners themselves. This will prevent the problem of learners feeling that what they learn is irrelevant to their future needs, and that they have to cope on their own when they go into English-speaking work situations. We would like to suggest similar studies be conducted on a broader scale in order to obtain a more complete picture of the training needs of students. The findings of this and similar studies should be relevant to many situations where immigrants are involved as participants in an educational programme.

In another study which focuses on more immediate contexts, the researchers (Sng et al, 2009) attempted to model the process of language learning when the learners try to pick up a language in complex real-life-situations in Singapore. In an attempt to build an awareness path for the language teaching practitioner with the use of this model, we seek to address the language situation from the perspective of foreign learners of English studying at the tertiary level. By describing the learners' assessments of their learning environment, as well as the strategies used by them to cope with the linguistic challenges, our study attempts to describe the English language learning environment in a country at the periphery of the English speech community.

In a later study Pathak (2010) shows that context of learning becomes more important while assessing online interaction formally or informally. In such contexts, attention should be focused on production of meaning rather than on discrete units of such interaction. The work of Akker et al (Akker, Theune, Truong, & Kok, 2010) is relevant in this context. They discuss the organization of activities in face-to-face meetings and relate these activities to speaker roles as well as speaker addressee patterns. They present a floor annotation procedure. (See Akker's work at <http://bit.ly/akker>) The floor annotation procedure reminds the teacher of the fact that speaking is not the same as having the turn. Both the person who has the turn and the one who does not are engaged in both speaking and listening. Similarly, the 'conversational floor' interactional model persuades us to take into account who is being addressed by the speaker. Both these ideas are ignored in the conventional classroom while teaching or assessing online interactions since educators tend to place too much importance on students taking a turn. More interestingly, *turn* and *floor* are unintentionally equated in some teaching procedures.

This research also focuses on students who might be physically present in the class but are less active in discussion. This behavior, labeled as 'lurking', as traditionally found upon. Teachers tend to demonstrate less tolerance towards students demonstrating such behaviour. They would probably identify such students and ask them to be more 'active' which would mean persuading them to take more turns or asking them to take hold of the floor. The analysis presented in this study (Pathak, 2010), however, forces the practicing teacher to re-think these strategies. Much of the lurking behaviour can actually be quite active. In our analysis, these listeners play an active role in later interactions. In our case study, two members of the group, had not made much of an appearance in the discussion earlier. However, the timely

posts made by these two members proved to be crucial at a later stage. A lack of this perspective is likely to make a teacher to coax students into initiating discussion and responding to initiation. Such direct or indirect persuasion is likely to diminish the very spirit of such online interactions. An understanding of this phenomenon would help a teacher to encourage students to help produce meaning rather than being merely engaged in overt interaction behaviour.

Focus on Conceptual Understanding

Although practice is important for a transfer of learning to real-life situations, it is equally important that deep-rooted conceptual understanding is achieved in any educational task. From our research it was quite evident that most of the Singapore classrooms aim at achieving conceptual understanding. In a study of practices in teaching and assessing multimedia-Based Oral Presentations, Pathak (1999) explains how the teacher can achieve understanding of conceptual practices:

“I encouraged the students to discover by themselves various aspects of presentation media while working on the presentation. No specifications were provided initially, but the learning was consolidated at the end of the exploration. This approach to teaching seems more workable since we are still far away from creating a solid body of knowledge in this area and since this situation continues to increase in complexity due to the power of the available presentation software. Since the students were quite comfortable with exploring software, they were encouraged to do so and were asked to apply various features meaningfully to the presentation situation. We tried to consolidate this learning in the debriefing session. I advised the students to concentrate on the functions.”

This description suggests that the following steps can be adopted for a successful understanding of concepts. This procedure is especially important for learning of a software.

- *Discovery*
- *Exploration*
- *Consolidation of learning*
- *Application of learnt principles*
- *Debriefing*

Let us now take an example from another important area of education. This example comes from a study in the field of reading comprehension. (Reading Skills for the Future, Pathak,) As far as the mechanics of reading is concerned, research on reading from a computer screen shows markedly different patterns in students' reading performance. Students also need to adapt to the different conventions involved in hypermedia accessing. Certain colours for instance indicate nodes, while certain others indicate visited links; signs such as a hand sign may also represent a node. Experience with using hypertext systems for learning has revealed a number of problems and critical issues. (See McKnight-*et-al*, 1990; Cunningham-*et-al*, 1993.) Based on this research in Singapore, the researchers have proposed an agenda for a reading curriculum for the near future. Although the agenda is preliminary, it highlights the peculiarity of reading skills required of professionals in a developing community.

We traditionally think of reading as a mode of accessing. Hypertext context involves a change in this reading pattern, since information can only be obtained after the reader acts on the matter. Search skills therefore become more

crucial in the hypertext context. Research in Singapore shows that this very structure of an electronic document demands a new set of search skills of the reader. To take this discussion further, we need to decide which exact skills would be required and in what sequence to undertake a Hypertext Search Process.

Considerable Value is placed on learning though Mistakes and Failures. Errors are Organized and Classified So that a Pattern can be Constructed. Short-Term Failures May Be Seen as Inevitable; Such ‘Failures’ that Aid the Learning May Even Be Systemically Encouraged

Although many teachers and educators instinctively recognize the value of mistakes in learning, traditional education usually tends to avoid and discourage mistakes and failure. However, recent theories and practices in Singapore education tend to recognize that failure can be ‘fruitful’ in some situations since it can strengthen and consolidate learning. Some researchers even go further to argue that failures of a certain type need to be *systematically* built into the teaching system. Such ‘designed failures’ can work to produce effective and productive learning. In a study by Pathak et al (2011), the researchers draw on Kapur (2008) to highlight a phenomenon in which students experiencing relative failures in their initial problem-solving efforts subsequently performed better than others who were in a condition not involving an initial failure. In the 2011 study, the researchers conducted a qualitative study that examined the problem-solving dynamics. Data for this study included video conversations of students, screen captures of their use of a computer model, and their submitted answers. Results indicated that initial struggle and failed attempts provided an opportunity to the students to expand their observation space and thus engage deeply with the computer model.

Researchers have discovered that failure needs to be ‘encouraged’ at some stages of instruction. Students avoid asking questions in the class since they are afraid of making mistakes. However, questioning based classrooms are known to develop thinking skills where questions are used as a tool for teaching and learning. In normal classrooms teacher teaches by exposition while students listen. In a study reported by Pathak (200) researchers analyzed a lesson in which video clips were used to encourage students’ questioning behavior. In this lesson the teacher began the lesson by stating objectives of the day, the later part of lesson was totally driven by video clips and discussed by students’ questioning and teacher answering. Video clips mainly consisted of short experimental activity. The experiment was clearly a success since there were 23 questions posed by student in the time frame of 35 minutes. One question led to another and, through these questions, two very important concepts were reinforced. Questions posed by students also helped to clear some misconceptions of the students.

Although students question play an important role in learning process, it has been reported that students ask fewer questions in normal class environment. This is because classrooms tend to discourage mistakes and failures at an early stage of learning. The result can be seen in a number of studies that have spanned across several countries that have reported low frequency of students’ questions. For instance, Graesser and Person (1994) reported that students rarely ask questions. Dillon(1988) reported that questions asked by students were .11 questions per hour per pupil for the average of 26.7 students per class.

The studies done in Singapore classrooms show that questioning and other learning behaviours can be encouraged by systematically building mistakes and failures at early stages of learning.

CONCLUSIONS

We began this study by asking two fundamental questions: Is there a singular model of Singapore educational

success? If yes, what are the essential elements of such a model? Although it is difficult to formulate a singular model, this paper tried to evolve a model that could provide some directions to educators that would like to emulate the general success of Singapore educational system. The model emerged from this review presents six core values: Collaboration, Application, Technology use, Interactivity, Context, and Error Integration. It is hoped that such characterization of this model will help educators in developing countries in Asia to create and design practices that emulate the Singapore success story in education.

As pointed out earlier, globalisation and intensifying economic competition were the driving forces behind most of these innovations. For a number of countries in Asia, Singapore stands as a model that they could follow and perhaps emulate. Further research is however needed in some of the following directions:

- How can we achieve collaboration without affecting the sense of individual achievement in classroom?
- While focusing on application of learned concepts, how can educators make sure that focus remains on conceptualization?
- How can we integrate technology use with curriculum objectives?
- What are the different ways of building interactivity in a planned lesson?
- How can we make sure that curriculum remains sensitive to students' learning context and still has a universal appeal?
- How can we design activities in which errors and failures are systematically integrated?

An effective use of the SMES model can only be made when we find answers to the six questions above and apply them to our own educational contexts.

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